**Just A Drop In The Bucket**

**Activity Overview**
Although the Earth is covered mainly by water, only a small amount is available for drinking. Using graduated cylinders to demonstrate the world’s water supply, we will show just how much of this water we can actually use. Have each beaker marked off with a black line to show students where to stop pouring so younger students do not have to know specific measurements.

**Objectives**
The elementary students will learn that:
- Water is a limited resource
- Water can be taken from above or below ground, and is only plentiful in some countries

**Materials**
- Eye Droppers
- Laminated photo cards of salt water, fresh water, frozen water
- 4 Beakers (2 large, 2 small)
- Container to hold Water
- Inflatable globe and mini globes (for display purposes)
- “Just A Drop In The Bucket” large photo sign

**Set-up**
- You will need to have all four beakers laid out (refer to Figure 1).
- Each beaker is marked with a black line.
- Put the laminated photo cards in front of the appropriate beakers. Flip them over so the students do not see the front of the card. 1000ml= All of the water on Earth, 970ml= Salt Water 20ml= Frozen Water, 10ml= Fresh Water.
- Fill the beaker with the black line at 1000ml. This represents “ALL of the water on the earth”.
- Leave the rest of the beakers empty for now.

**Takedown**
- Please note once the event is over for the day, all the materials need to be put away.
- Items should be placed all into one box labelled “Just a drop in the bucket”.
- Make sure that the beakers and all containers with water are emptied and dry.

**Safety**
- Be sure that students do not touch with the beakers or play with any equipment set up for this activity.

**Vocabulary**
- **Groundwater** – Water that is found underground in the spaces and cracks between soil.
- **Aquifer** – A natural underground area where large quantities of groundwater fill the spaces between soil, sand, gravel and rock.
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**What will I be doing? (Procedure)**
*Before you start your presentation check with the teacher or chaperone that the entire group is present and ready to start.*

Remember that **doing** an experiment and **discovering** the answer is more powerful than watching and listening to someone, so try to involve as many children as possible.

- **Say:** “Welcome to Just a Drop in the Bucket. We will be learning about how much water there is on Earth and how much of that water is actually available to drink. Keep our lakes and well water pollution-free because there is only a limited amount of water available for drinking.”

- **Ask:** “What do you use water for in your daily lives?”
  Encourage them to think of indoor uses and outdoor uses of water.

- **Ask:** “Where do we find water on earth?”
  **Answers:** Oceans, lakes, streams, rivers, underground in aquifers and frozen in glaciers

- **Say:** “Groundwater is water that is found underground in the spaces and racks between soil. The underground areas with a lot of groundwater are called aquifers.”

- **Ask:** “Why are we so lucky to live where we do?”
  **Answer:** We have access to clean water.

- **Ask:** “What water source do we live near?”
  Point to where we are on the large globe. Let the kids look at the smaller globes. **Say:** “The Great Lakes are very important because they have 20% of all the freshwater on Earth!” **Ask:** “Which Great Lake are we close to in Peel?” (**Answer:** Lake Ontario). Have the students pass around the mini globes to see just how much water there is on the earth.

- Show students the beaker with the black line at 1000ml (1 litre). **Say:** “This beaker holds 1 litre of water. For this activity, let us pretend that all of the water on the earth, including glaciers and groundwater takes up 1 litre.”

- **Ask:** “Guess how much of that 1 litre of water represents the amount of salt water in the oceans?” (refer to the globe). Get them to point to the beaker with the black line that would represent the amount of salt water. This would be the one marked 970ml.

- Pour water from the first 1L beaker up to the line. **Say:** “This is the amount of the earth’s water that is found in the oceans as salt water.”
  Flip the photo card “Salt Water” in front of the beaker.

- **Ask:** “Why can’t we drink salt water?”
  **Answer:** Humans cannot drink salt water because the kidneys can only make urine that is less salty than salt water. Therefore, to get rid of all the excess salt taken in by drinking salt water, you would have to urinate more water than you drank, so you would die of dehydration. Marine animals have kidneys or other organs that remove large amounts of salt from their bodies.)

- **Ask:** “Guess how much of the world’s water is frozen?”
  Ask them to point out what beaker would represent frozen water. Then pour water from the original 1L beaker up to the black line of the beaker marked at 20ml. Tell them that this represents the amount of earth’s water that is frozen. Flip the photo card “Frozen Water” in front of the beaker.

- **Ask:** “Guess how much of the world’s water is fresh?”
  Pour from the original 1L beaker into the one you have marked at 10mL. Flip the photo card “Fresh Water” in front of this beaker.

- **Say:** “Even though this is fresh water, we can’t drink most of it either.”
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- **Ask:** “Do you know why we can’t drink most of this fresh water?”
  - **Answer:** groundwater, pollution and/or trapped in soil

- With the eyedropper, from the 10 mL fresh water beaker, put one drop into the palm of a student’s hand. Explain that this is all of the available fresh water we have to share on this planet.

**Specific Reminders for Students:**
- Only a very small amount of the world’s total water is available for human consumption
- The water that is available is not distributed evenly around the world (some countries have very little, some, like Canada, have a lot)
- Conserving water is important everywhere in the world!
- Keep our lakes and well water pollution-free because there is only a limited amount of water available for drinking.

Ask students to tell you ways that they can conserve water:
- Turning off the tap when brushing teeth and lathering up (for showers and hand washing)
- Taking shorter showers
- Use a jug of water in the fridge, or ice cubes for a cold glass of water, instead of running the tap until it gets cold.

**Background Information (FOR HIGH SCHOOL STUDENT REFERENCE)**

Most of the earth consists of water, there is much more water than there is land.

About 70% of the earth’s surface is covered in water, but water also exists in the air as vapour and in aquifers in the soil, as groundwater.

**World Water Distribution/Availability:**
- 97% of the world’s water is SALT WATER
- 2% of the world’s water is FROZEN in polar ice caps and glaciers
- 1% of the world’s water is FRESH WATER and of that most is unavailable (too far underground, polluted, or trapped in soil, etc.) for human use
- Only 0.01% of the total water on earth is actually accessible for humans to consume

**Great Lakes Info:**
- The Great Lakes hold 20% of the world’s surface fresh water
- Forty million people live in the Great Lakes basin
- All aspects of the natural environment, from weather and climate, to wildlife and habitat are affected by the Great Lakes system
- The long history of agricultural and industrial development has placed the Great Lakes basin’s ecosystem under tremendous stress. The challenge is to minimize the pressures on the environment by changing the way we live and do business.
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